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Deschutes County Natural Resources Conservation Service Strategic Plan

2011 - 2016

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Section 1: Introduction

This Natural Resources Long Range Strategy lays out a road map for the Natural Resources Conservation Service (NRCS) and its conservation partners to effectively address some of the most important and urgent natural resource problems facing Deschutes County. The purpose of the strategy is to identify priority resource problems, describe desired future outcomes, and establish measurable objectives so that NRCS and its partners can focus financial and technical assistance to achieve measurable and meaningful outcomes.

This Natural Resource Long Range Strategy covers the period from 2011 – 2016. The strategy will serve as the guiding document for NRCS decisions regarding delivery of financial and technical assistance and administration of conservation programs. This is a living document, intended to be updated and modified, as appropriate, to account for emerging issues.

During the summer of 2010, the NRCS Deschutes Field Office conducted Strategic Conservation Community Meetings to gather input for the development of this document. During these special local work group meetings, NRCS and its partners identified natural resource problems facing Deschutes County and prioritized these problems based on the importance of each and our ability to treat them given current knowledge and technology. A similar meetings were held in 2012 and 2013 to update the resource issues if needed and discuss priorities and progress

Vision: Productive lands - healthy environment

Mission: Helping people help the land. To build alliances and strategically invest financial and technical resources to solve natural resource problems in Deschutes County

Purpose of the Plan: To provide a framework supported by good information from a wide range of partners to solve important resource problems. It will identify what and where the problems are, prioritize these that are most serious or within our ability to fix and propose solutions, time lines and measurable outcomes and resources needed to get the job done. This will serve as guidance in establishing priorities and direction in the use of NRCS resources and programs.

Time Frame: The time frame covered by the plan begins January 2011 and ends December 2016

Partners Involved: NRCS gratefully acknowledges the assistance of the following partners in the development of this document.

- USDA NRCS
- Deschutes SWCD
- Oregon Department of Agriculture
- Oregon Department of Forestry
- Deschutes River Conservancy
- Central Oregon Irrigation District
- Oregon Watershed Enhancement Board

- Central Oregon Intergovernmental Council
- OSU Extension
- Central Oregon Intergovernmental Council
- Deschutes County Vegetation Management

Section 2: Natural Resource Inventory

This section provides baseline information about the resource challenges facing Deschutes County. This section addresses human, soil, water, air, plant, animal, and energy resource concerns that will impact conservation and development activities in future years.

A resource concern is an expected degradation of the soil, water, air, plant, or animal resource base to an extent that the sustainability or intended use of the resource is impaired. Because NRCS quantifies or describes resource concerns as part of a comprehensive conservation planning process that includes client objectives, human and energy resources are considered components of the resource base. This section shows the natural resource inventory organized into Major Resource Concerns that include

- Soil Erosion
- Soil Quality Degradation
- Excess / Insufficient Water
- Water Quality Degradation
- Degraded Plant Condition
- Inadequate Habitat for Fish and Wildlife
- Inefficient Energy Use
- Air Quality Impacts

Major Resource Concerns are further broken down into 31 natural resource concerns.

Many of these resource concerns have been identified by agency and stakeholder management plans, including but not limited to:

Management Plan	Agency
NRCS Rapid Watershed Assessment Profiles: • Upper Deschutes – 17070301 • Little Deschutes - 17070302 • South Fork Crooked - 17070303 • Lower Crooked – 17070305	Natural Resource Conservation Service
Soil Survey OR620 Upper Deschutes River Area	Natural Resource Conservation Service

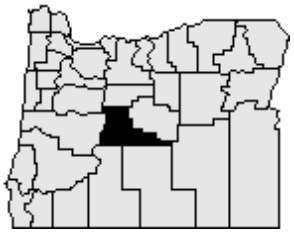
Management Plan	Agency
Deschutes Field Office Technical Guide	Natural Resource Conservation Service
Upper Deschutes Agriculture Water Quality Management Plan	Oregon Dept. Agriculture and Deschutes Soil & Water Conservation District,
Crooked River Watershed Assessment	Crooked River Watershed Council.
Wy'East Resource Conservation & Development Area Plan	Wy'East Resource Conservation & Development Council
Deschutes Subbasin Plan	Northwest Power and Conservation Council
Oregon Department of Fish and Wildlife (ODFW) Conservation Strategy	Oregon Department of Fish and Wildlife

The NRCS Subbasin Profiles provide a natural resource snapshot and overview of each Oregon 8-Digit Hydrologic Unit or watershed. The Subbasin Profiles organize into one document information that local conservationists, landowners and others can use to: identify conservation opportunities and direct technical and financial resources to the appropriate subbasins. They provide a concise description of the subbasins' natural resources, resource concerns, conservation needs, and ability to resolve natural resource issues. These profiles organize into one document what most local conservationists and landowners already know about their watersheds.

Physical resources, land use and land cover, common resource areas, soils, stream, precipitation data, resource concerns, census and social data.

NRCS published the Watershed Profiles based on the HUC. The 8-digit HUC watersheds within Deschutes County include:

- Upper Deschutes – 17070301
- Little Deschutes - 17070302



- South Fork Crooked – 17070303
- Lower Crooked – 17070305

http://www.or.nrcs.usda.gov/technical/watershed-resources.html

Resource Concern: Humans

Deschutes County is located on the east side of the Cascades in central Oregon. The population of Deschutes County is approximately 157,733 with the largest population centers being Bend, Redmond and Sisters.

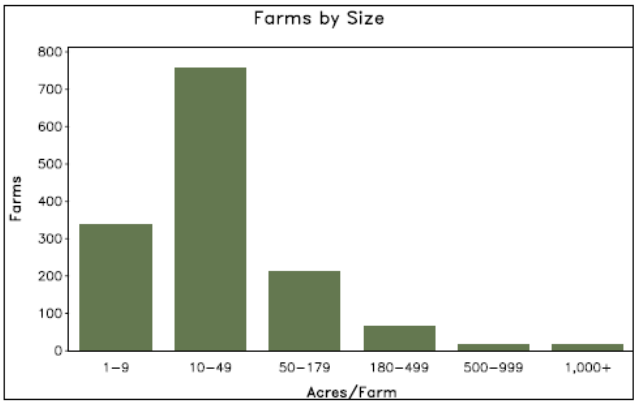
About
Population (2009): 170,705
Established: Dec. 13, 1916
Elev. at Bend: 3,628'
Area: 3,055 sq. mi.
Average Temp.: January 30.5° July 65.5°
Assessed Value: $17,740,724,079
Real Market Value: $23,496,169,372
Annual Precipitation: 12"
Economy: Tourism, retail trade, forest products, recreational equipment, aviation, software and high technology

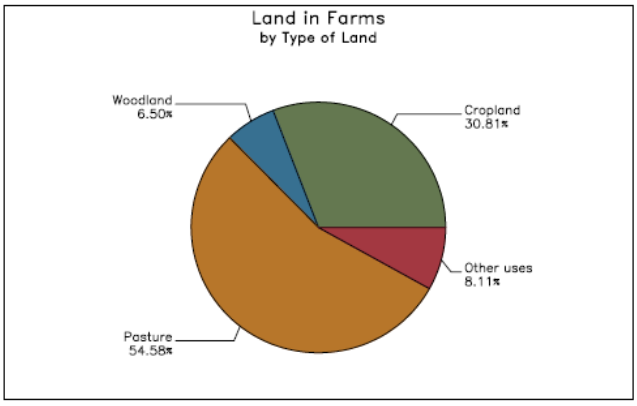
Source: http://bluebook.state.or.us/local/counties/counties16.htm

Types of Farm Operations

Number Types & Size of Farms. The data included in this section is from the **2007 Census of Agriculture.** The following is a quick profile of Deschutes County agriculture and producers. Deschutes County farm land comprises approximately 129,369 acres. The average size farm is 92 acres. The largest land in farms by land type is pasture, followed by cropland then woodland. The total number of farms is 1,405. The number and types of farm operations are identified below.

Deschutes County Farms			
	2007	2002	% Change
Number of Farms	1,405	1,632	- 14
Land in Farms	129,369 acres	138,226 acres	- 6
Average Size of Farm	92 acres	85 acres	+ 8
Source: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Oregon/cp41065.pdf			





Operator Characteristics	Quantity
Principal operators by primary occupation:	
Farming	573
Other	832
Principal operators by sex:	
Male	1,039
Female	366
Average age of principal operator (years)	57.1
All operators by race [2]:	
American Indian or Alaska Native	20
Asian	4
Black or African American	4
Native Hawaiian or Other Pacific Islander	4
White	2,195
More than one race	11
All operators of Spanish, Hispanic, or Latino Origin [2]	29

All Sources Above: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Oregon/cp41065.pdf

Types and Size of Farm Operations

The Economic Research Service has established a system to group farms by similar characteristics.

Large family farms have market value of agricultural products gross sales between $250,000 and $499,999 and the principal operator who reports his/her occupation as being primarily farming. There are 8 farms and 13,065 acres.

Nonfamily farms are farms organized as nonfamily corporations, as well as farms operated by hired managers. There are 50 farms and 29,263 acres.

Small Family Farms, Farming Occupations/Higher Sales have market value of agricultural products gross sales between $100,000 and $240, 999 and the principal operator who reports his/her occupation as being primarily farming. There are 8 farms.

Small Family Farms, Farming Occupations/Lower Sales have market value of agricultural products gross sales of less than $100,000, and the principal operator who reports his/her occupation as being primarily farming. There are 165 farms and 17,284 acres.

Small Family Farms, Limited-Resource have a market value of agriculture products sold gross sales of less than $100,000, and the total principal operator household income of less than $20,000. There are 224 farms and 17,779 acres.

Small Family Farms, Residential/lifestyle have market value of agricultural products gross sales of less than $100,000, and the principal operator who reports his/her occupation as other than farming. There are 555 farms and 22,707 acres.

Small Family Farms, Retirement have market value of agricultural products gross sales of less than $250,000, and the total principal operator who reports being retired. There are 392 farms and 23,951 acres.

Deschute County Farm Operations 2007 Census of Agriculture	
Data Item	**Value**
Large Family Farms – Acres	13,065
Large Family Farms – Number of Operations	8
Non family farms – acres	29,263
Non family farms – Number of Operations	50
Small Family Farms, Farming Occupations/Higher Sales – Number of Acres	
Small Family Farms, Farming Occupations/Higher Sales – Number of Operations	8
Small Family Farms, Farming Occupations/Lower Sales – Acres	17,284
Small Family Farms, Farming Occupations/Lower Sales – Number operations.	165
Small Family Farms, Limited-Resource – Acres	17,779
Small Family Farms, Limited-Resource – Acres – Number of	224
Small Family Farms, Residential/lifestyle – Acres	22,707
Small Family Farms, Residential/lifestyle – Number of operations	555
Small Family Farms, Retirement – Acres	23,951
Small Family Farms, Retirement – Number of Operations	392

Deschutes County Overview

Only 461,000 acres or 23% of the county is privately owned. The US Forest service owns 996,500 ac on the west side of the county. The Bureau of Land Management has 538,500 ac., mostly in the eastern part of the county. Oregon Department of State Land has 41,000 acres, also in the eastern portion.

Deschutes County has a wide range of growing seasons because of elevation differences. Growing high-value crops can be risky at even some of the lower elevations. Frost can happen any time during the short growing season.

Climate definitely limits crop production. Through the years, many crops have come and gone, while other crops have been the mainstay for local producers.

Hay and pasture have always been the main irrigated crops and are the foundation of the livestock industry, with 35,000 to 40,000 acres grown annually for at least the last 30 years. Alfalfa, alfalfa/grass and different grass species are grown for hay. The hay is sold to dairies, feed stores and farms and ranches, locally and out of county, and exported, as well as fed on-farm and on-ranch.

Less than 1000 acres of wheat, vegetable seed and peppermint are grown in the northern part of the county, and some grape vineyards are being planted.

There is also a thriving nursery industry, along with some turf production and several lavender farms. The local food movement is strong with community-supported agriculture farms and market gardens. In the past, crops included wheat, barley, oat, rye, triticale, peppermint and potatoes, with minor plantings of sugar beets, chickpeas and garlic, vegetable and Kentucky bluegrass seed. Even strawberries and orchard fruit were commercially grown in Central Oregon long ago.

Livestock production is a large portion of the agricultural industry. Cattle, horses and llamas are the main animals raised, with around 10,000 beef and dairy cows and over 4000 horses in the county. More people are raising dairy and meat goats, and artisan cheese makers have thriving businesses.

Land Use

Deschutes County covers an area of 3000 square miles.

Deschutes County Land Use (private land)	
CROPLAND - ACRES	39,857
CROPLAND - NUMBER OF OPERATIONS	849
IRRIGATED - ACRES	37,821
IRRIGATED - NUMBER OF OPERATIONS	1215
PASTURELAND - ACRES	88,567
PASTURELAND - NUMBER OF OPERATIONS	1,096
Includes rangeland	
WOODLAND - ACRES	8,407
WOODLAND - NUMBER OF OPERATIONS	215
Includes natural or planted woodlots	
WOODLAND, PASTURED - ACRES	3,778
WOODLAND, PASTURED - NUMBER OF OPERATIONS	86
Includes woodland used for pasture or grazing.	
ORGANIC - ACRES	305
ORGANIC - NUMBER OF OPERATIONS	15
Source: NASS Census Of Agriculture 2007	

Tribes & Treaty Rights

Much of Deschutes County is within the Ceded lands of the Confederated Tribes of Warm Springs. The Confederated Tribes are comprised of the Wascos, Tenino and Northern Paiute peoples. Prior to the reservation, the Wascos tended to concentrate near the Columbia River, the Tenino people ranged farther south and east up the Deschutes and John Day rivers and the Paiute still farther south into the Great Basin.

Resource concern: Soils

The Natural Resources Conservation Service has published a Soil Survey that covers most of Deschutes County. Published Soil Survey OR620- Upper Deschutes River Area

Source: http://www.or.nrcs.usda.gov/pnw_soil/or_data.html

Common Resource Areas

The USDA has developed a method of characterizing geographical areas that share similar natural resource characteristics known as common resource Areas (See Map). These areas are defined as geographical areas where local resource concerns, problems or treatment needs are similar. These areas are considered a subdivision of an existing Major Land Resource area (MLRA) Landscape conditions, soil climate human considerations, and other natural resource information are used to determine the geographic boundaries of a common Resource Area.

6.11 - Cascade Mountains, Eastern Slope - Pumice Plateau Forest: This unit occurs on the southern extreme of the MLRA and is characterized by nearly level to undulating pumice-mantled plateaus that support dominantly lodgepole pine and ponderosa pine. The soils consist of deep deposits of ash and pumice from Mt. Mazama. Cold temperatures and frost limit the production of ponderosa pine. The temperature regime is cryic, and the moisture regime is xeric.

6.9 - Cascade Mountains, Eastern Slope - Ponderosa Pine/Bitterbrush Woodland: This unit is characterized by undulating ash-mantled lava flows. The vegetation is dominantly ponderosa pine, antelope bitterbrush, and Idaho fescue. The unit does not have the dominance of lodgepole pine and the coarse pumice fragments that are characteristic of unit 6.1. The temperature regime is frigid, and the moisture regime is xeric.

3.4 - Olympic and Cascade Mountains - Cascade Subalpine-Alpine: This unit consists of high, glaciated, volcanic peaks that rise above subalpine meadows. It is characterized by barren rock outcroppings, lava flows, and volcanic peaks. Elevation is 5,600 to 12,000 feet. Active glaciation occurs on the highest volcanoes and decreases from north to south. The winters are very cold, and the growing season is extremely short. Flora and fauna adapted to the high elevations include herbaceous and shrubby subalpine meadow vegetation and scattered patches of mountain hemlock, subalpine fir, and whitebark pine.

3.5 - Olympic and Cascade Mountains - Northern Cascade Crest Montane Forest: This unit consists of an undulating plateau punctuated by volcanic buttes and cones that reach a maximum elevation of about 6,500 feet. It is extensively forested with mountain hemlock and Pacific silver fir. The temperature regime is cryic, and the moisture regime is udic. Although this unit has the same moisture and

temperature regimes as unit 3.3, this unit is noticeably more moist. The break between units 3.3 and 3.5 is transitional.

6.10 - Cascade Mountains, Eastern Slope - Cold Wet Pumice Plateau Basins: This unit is characterized by cold wet basins. The soils are dominantly ash and pumice from Mt. Mazama. This unit has extensive wetlands in Klamath and Sycan Marshes and groundwater quality issues in Lapine Basin. The temperature regime is cryic, and the soil moisture regime is aquic.

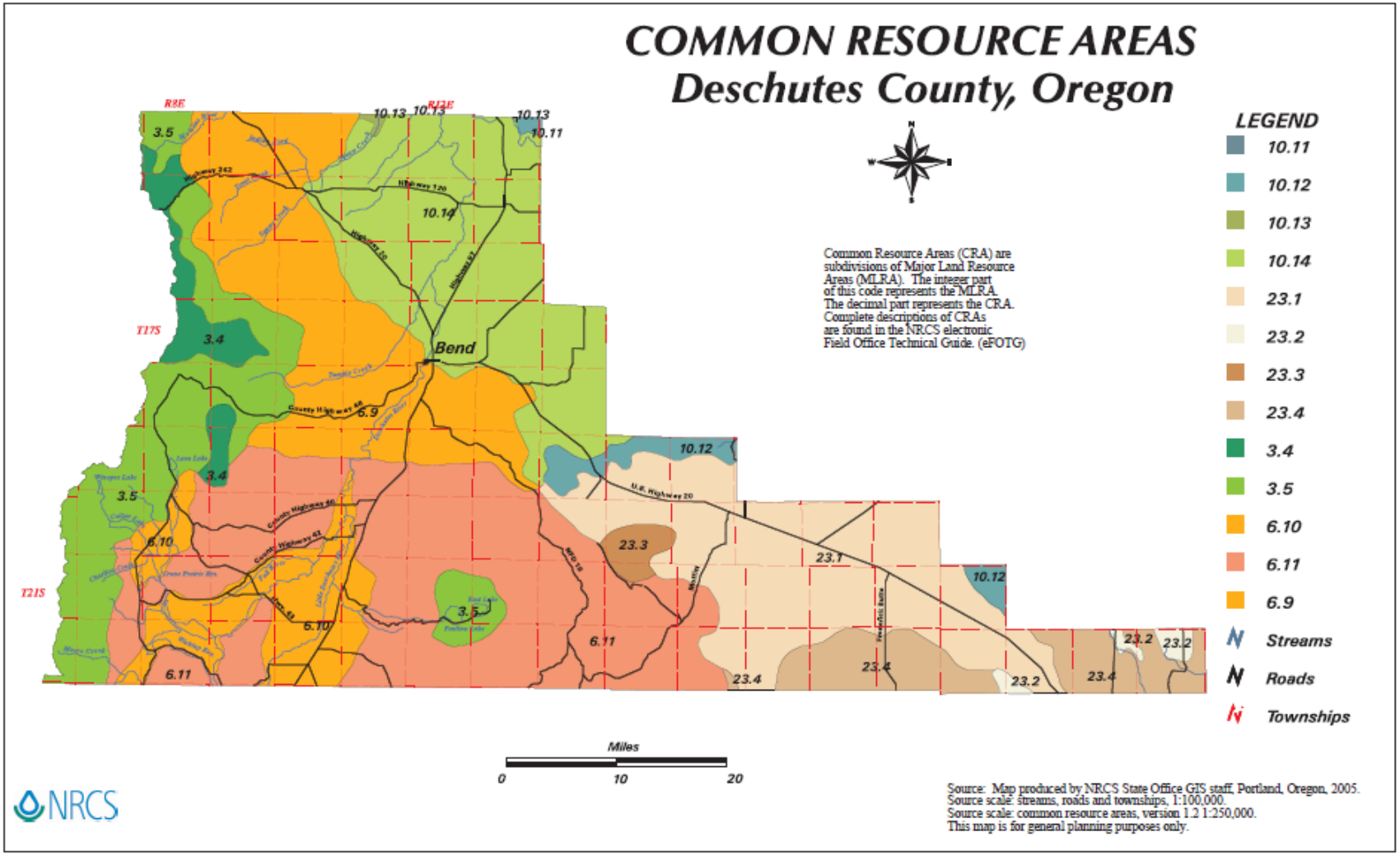
10.12 - Central Rocky and Blue Mountain Foothills - Cool Dry Blue Mountain Foothills: This unit is characterized by rangeland soils on hills and mountains associated with basalt. The dominant soils are those of the Searles, Redcliff, Choptie, and Madeline series. The temperature regime is frigid, and the moisture regime is aridic. The mean annual precipitation is 10 to 12 inches. The vegetation is dominantly Wyoming big sagebrush and bluebunch wheatgrass and a lesser amount of Idaho fescue.

10.14 - Central Rocky and Blue Mountain Foothills - Bend-Redmond Lava Plains: This unit is characterized by moderately deep and shallow soils that formed in ash from Mt. Mazama and are underlain by basalt. Most areas are used for irrigated pasture and hay. Slopes are nearly level to undulating. The dominant soils are those of the Deschutes and Deskamp series. The soils are sandy loam or loamy sand throughout. The temperature regime is mesic, and the moisture regime is aridic.

23.1 - Malheur High Plateau - Ashy Pluvial Lake Basins: This unit is characterized by cold basins that contain significant amounts of volcanic ash. The basins are Millican Valley and Fort Rock Basin. The temperature regime is frigid, and the moisture regime is aridic. The dominant soils are those of the Fort Rock, Bonnick, Abert, Gardone, and Borobey series. Most of the soils are well drained. Few wetlands are present.

23.4 - Malheur High Plateau - High Lava Plains: This unit is on basalt plateaus and escarpments of fault-block mountains. The temperature regime is frigid or mesic, and the moisture regime is primarily aridic. The soils typically are shallow or moderately deep to bedrock or a cemented pan and have a strongly developed argillic horizon. The vegetation is dominantly low sagebrush, Wyoming big sagebrush, Idaho fescue, Thurber needlegrass, and bluebunch wheatgrass. Playas, small intermittent lakes, and clay that has high shrink-swell potential are common in the depressions.

See Common Resource Area Map below.


COMMON RESOURCE AREAS
Deschutes County, Oregon
LEGEND
10.11
10.12
10.13
10.14
23.1
23.2
23.3
23.4
3.4
3.5
6.10
6.11
6.9
Streams
Roads
Townships
Common Resource Areas (CRA) are subdivisions of Major Land Resource Areas (MLRA). The integer part of this code represents the MLRA. The decimal part represents the CRA. Complete descriptions of CRAs are found in the NRCS electronic Field Office Technical Guide. (eFOTG)
R8E
R12E
T17S
T21S
Bend
Miles
0
10
20
NRCS
Source: Map produced by NRCS State Office GIS staff, Portland, Oregon, 2005.
Source scale: streams, roads and townships, 1:100,000.
Source scale: common resource areas, version 1.2 1:250,000.
This map is for general planning purposes only.

Rescource Concern: Water Quality & Quanity

Climate

Precipitation in the Upper Deschutes Basin varies dramatically. The average annual precipitation is 11 inches at Madras and Bend and 24 inches at Chemult. Most of the precipitation, about 70 percent, falls during November through April. During the driest months, which are July, August, and September, the average monthly precipitation is less than 1 inch. The amount and duration of snowfall in winter is variable, but the southern part of the area receives the highest amounts for the longest duration. (Natural Resources Conservation Service, 1999)

Bend gets about 12 inches of rain per year. The number of days with any measurable precipitation is 77. On average, there are 162 sunny days per year. The July high is around 82 degrees. The January low is 22.

Climate	Bend, OR
Rainfall (in.)	11.6
Snowfall (in.)	32.6
Precipitation Days	77
Sunny Days	162
Avg. July High	82
Avg. Jan. Low	21.6

http://www.bestplaces.net/climate/city/oregon/bend

Water Resources

Most of Deschutes County drains to the Deschutes River. A small area at the far south side drains into Summer Lake. Major water courses are Whychus Creek, Little Deschutes River, the Deschutes River and Crooked River. The rivers and streams are influenced by the climate of the region with most of the precipitation falling in the winter and very little in the summer. Snowmelt contributes later season water to those streams with sources at higher elevations… Peak flows tend to be higher than were present in post settlement times due to changes in such watershed characteristics as vegetative cover, road construction and channel modifications. Whychus Creek, parts of the Deschutes River and the Crooked River have all been identified as water quality limited for temperature by Oregon Department of Environmental Quality. (DEQ)

Almost all of the irrigation water for the roughly 40,000 irrigated acres is managed by five irrigation districts. Central Oregon Irrigation District (COID) is the largest with 44,000 ac. including some land in Crook County. The primary source is Deschutes River water that is stored in the Wickiup Reservoir. Winter water is also captured and stored at Crane Prairie Reservoir above Wickkiup. The water is released during the irrigation season and enters the canal system at a diversion near Bend. Their total water diversion averages over 299 thousand ac.ft. per year but some of that is delivered to Crook County. There are over 200 miles of canals and laterals in the project and losses from these canals were estimated at over 90,000 ac ft per year or 50%.

Three Sisters Irrigation District (TSID) serves 7570 ac. of land in the Sisters area with water diverted from Whychus Creek. They have been actively converting their canal system to pressurized pipe and returning some of the saved water to the stream. Tumalo irrigation district serves 8200 ac of land, Swalley Irrigation district serves 4310 ac. And Arnold Irrigation district serves 4385 ac.

Subdivision of farms into smaller units and outdated irrigation systems make managing irrigation water difficult. COID estimated in 2002 that 65% of their district was still using flood irrigation. Even assuming that some of that has been converted to sprinklers since then, there is still a significant amount of land with inefficient irrigation methods. Tailwater from flood systems is not systematically captured back to the district systems and can be a source of sediment and nutrient problems downstream.

Irrigation

Irrigation is an important aspect to agriculture in Deschutes County today. The table below is broken down by the number of irrigators and acres irrigated.

Deschutes County Agriculture Irrigated Acres and Number of Operations		
Acres & Operations	**Acre Range**	**Units**
Irrigated - Acres	1.0 to 9.9 Acres	1042
Irrigated - Number of Operations	1.0 to 9.9 Acres	269
Irrigated - Acres	10.0 to 49.9 Acres	10365
Irrigated - Number of Operations	10.0 to 49.9 Acres	682
Irrigated - Acres	50.0 to 69.9 Acres	1823
Irrigated - Number of Operations	50.0 to 69.9 Acres	51
Irrigated - Acres	70.0 to 99.9 Acres	3709
Irrigated - Number of Operations	70.0 to 99.9 Acres	73
Irrigated - Acres	100 to 139 Acres	3390
Irrigated - Number of Operations	100 to 139 Acres	51
Irrigated - Acres	140 to 179 Acres	1421
Irrigated - Number of Operations	140 to 179 Acres	16
Irrigated - Acres	180 to 219 Acres	1800
Irrigated - Number of Operations	180 to 219 Acres	9
Irrigated - Acres	220 to 259 Acres	1279
Irrigated - Number of Operations	220 to 259 Acres	16
Irrigated - Acres	260 to 499 Acres	4836

Deschutes County Agriculture Irrigated Acres and Number of Operations		
Acres & Operations	**Acre Range**	**Units**
Irrigated - Number of Operations	260 to 499 Acres	29
Irrigated - Acres	500.0 to 999 Acres	1361
Irrigated - Number of Operations	500.0 to 999 Acres	7
Irrigated - Acres	1000 to 1999 Acres	4101
Irrigated - Number of Operations	1000 to 1999 Acres	8
Irrigated - Acres	2,000 Acres or More	2395
Irrigated - Number of Operations	2,000 Acres or More	29
Irrigated - Acres	Total Acres	37522
Irrigated - Number of Operations	Total Operations	1240
Source: NASS Census Of Agriculture 2007		

Resource Concern: Air and Energy

Agriculture producers have become more aware of energy as a resource concern. Energy is an issue in terms of fuel costs for agricultural operations and cost and availability of electricity for pumping irrigation water and indirect energy costs for fertilizer and chemicals. Opportunities to produce energy on-farm that did not exist previously include solar, biomass and manure.

Several of the irrigation districts in the Deschutes Basin have been working to put some of their canals into pipes. This provided the opportunity to provide gravity pressurized water to the farms to reduce the pumping needs and also to generate electricity with small scale hydroelectric plants. Central Oregon Irrigation District has developed hydropower on two sites. Three Sisters Irrigation District has a plant under construction. The Wy'East Save Water – Save Energy program has assisted irrigators to implement energy conservation measures such as scientific irrigation scheduling and the installation of variable frequency drives for pumps. This saves irrigators approximately 10 to 20 percent on energy and water pumped.

Utilities serving Deschutes County include Central Electric Cooperative and Pacific Power and Light. Both utilities have energy efficiency and conservation program targeted at agriculture energy.

The NRCS policy has recently recognized energy as a resource concern:
(1) Improving the efficiency of energy use;
(2) Conserving energy;
(3) Producing renewable energy;
(4) Producing biomass energy feed-stocks in a sustainable manner.

Air resource concerns are intermittent field burning and forest fire smoke.

Resource Concern Plants & Animals

A significant animal related resource concern centers on sensitive fish species. The Deschutes River is home to fall chinook, summer steelhead, bull trout and resident rainbow "redband" trout. All of these species are sensitive to water quality and are the basis for the water quality listings of those listed streams. They need clean, cool water with pools and good stream habitat structure and vegetation to thrive. Whychus Creek, Paulina Creek, Tumalo Creek and the Little Deschutes River are all tributaries listed as water quality limited. Recent improvements at the Pelton Dam complex, below the confluence of the Crooked River, have made the reintroduction of anadromous fish feasible. Suitable habitat above the dams for migratory fish like steelhead and salmon may now be available for population recovery.

The Oregon Spotted Frog has been proposed to be listed as Threatened. Critical habitat be identified and will include areas around the rivers, lakes and streams above Bend. They need a combination of aquatic habitats with perennial water and emergent vegetation. Encroaching Reed Canary Grass, excessive woody vegetation and nonnative predators are all contributing to population declines.

Noxious and invasive plants are a problem, mostly on range land and unfarmed areas. Thistles, the knapweeds, white top, kochia and dalmation toadflax are all known to be present. Annual grasses such as cheatgrass and Medusahead Rye are also problems on rangeland

Expansion of western juniper on rangeland is a significant issue. A study in 1988 showed that there were over 350 thousand acres in the county with junipers with 90 thousand on private land. The same study estimated a 3 fold increase in land with junipers since 1936. Much of this is areas where juniper is increasing beyond its normal range and density. As juniper increases, native shrubs and eventually grasses are declining. They are replaced by invading weeds and annual grasses or in extreme situations, bare soil. This not only reduces forage available for livestock and wildlife, it also can increase erosion, increase sediment delivery to streams and reduce groundwater recharge for streams and springs. The diversity of the plant community decreases dramatically with the loss of shrubs and native grasses. Wildlife that is dependent on the more open shrub/ bunchgrass community will lose their habitat. Sage grouse are a species that has been identified as particularly affected by this change in habitat due to loss of sage brush and increase of perching sites for predators.

Significant areas of the forest land, both public and private are in poor health. Overstocked stands, insect and disease damage and other man caused or natural factors have increased risk of catastrophic wild fires and reduced productivity. Residential development in and near these areas raises the concern for loss of life and property. Ecological damage from large intense fires impacts wildlife, water quality and people's use of these lands.

Section 3 Natural Resources Progress Analysis

This section looks at where conservation partners are focusing their efforts, what overall conservation progress has been made in the county during from 2006 – 2010 by the conservation partners and NRCS. While resource concerns have been addressed by the application of conservation applied on the ground, this section addresses resource concerns that need to be addressed in the future. Finally, an analysis will be made as to where NRCS should invest conservation program incentives in future years.

Integrated Data Enterprise Analysis

The NRCS integrated Data Enterprise Analysis (IDEA) provides a summary of practices planned or applied in Deschutes County from 2006 through 2010. This data is used for workload planning, progress tracking, trends, management reviews, and quality assurance.

Integrated Data Enterprise Analysis					Benefits					
Pr. Code	Practice Name	Pr. Unit	Applied Amount	Applied Count	Soil	Water	Animal	Plants	Air	Energy
327	Conservation Cover	ac	162.6	14	x	x		x	x	
328	Conservation Crop Rotation	ac	784.4	15	x	x		x	x	x
378	Pond	no	4	4		x				
382	Fence	ft	3,525.00	5			x	x		x
391	Riparian Forest Buffer	ac	98.8	4	x	x	x	x	x	
441	Irrigation System, Microirrigation	ac	4	2		x				x
442	Irrigation System, Sprinkler	ac	304.7	40		x				x
443	Irrigation System, Surface and Subsurface	ac	10	2		x				x
449	Irrigation Water Management	ac	1155	57		x				x
490	Tree/Shrub Site Preparation	ac	119.8	6	x			x		
511	Forage Harvest Management	ac	466.8	35				x		
512	Forage and Biomass Planting	ac	11.5	4				x		x
516	Pipeline	ft	1,000.00	1		x				
528	Prescribed Grazing	ac	1,103.40	17			x	x		x
533	Pumping Plant	no	11	8		x				x
578	Stream Crossing	no	8	8		x				
587	Structure for Water Control	no	150	41		x				
590	Nutrient Management	ac	203.1	28		x		x	x	x
595	Integrated Pest Management	ac	65.2	3		x		x	x	x
612	Tree/Shrub Establishment	ac	119.8	6	x			x		x
633	Waste Recycling	ac	176.1	27					x	x
660	Tree/Shrub Pruning	ac	176.4	3	x			x	x	
666	Forest Stand Improvement	ac	311.4	6	x			x	x	x
776	Irrigation Water Conveyance, On-Ground	ft	490	2		x				x

Integrated Data Enterprise Analysis					Benefits					
Pr. Code	Practice Name	Pr. Unit	Applied Amount	Applied Count	Soil	Water	Animal	Plants	Air	Energy
	Aluminum Pipleline									
794	Irrigation Water Conveyance, Corrugated, Ribbed or Profile wall thermal pipeline	ft	8,923.00	1		x				x
430HH	Irrigation Water Conveyance, Pipeline, Rigid Gated Pipeline	ft	770	2		x				x
521A	Pond Sealing or Lining, Flexible Membrane	no	3	3		x				

Partner Conservation Activities

The conservation activity in Deschutes County is the result of a cooperative effort by the Natural Resources Conservation Service (NRCS), and its conservation partners. The leadership role of the Deschutes County Soil and Water Conservation District and the members of its staff cannot be over-stated in maintaining the relationship with each of the organizations and agencies listed below.

Deschutes Soil and Water Conservation District (SWCD). The Deschutes SWCD is the sponsoring organization for the NRCS presence in Deschutes County. The Deschutes County SWCD is very active in promoting and assisting conservation efforts on private agricultural land. They have an active information and outreach program that helps provide assistance to landowners. They hold on farm workshops with an emphasis on promoting good resource management for new and smaller landowners. They sponsored and helped develop a Rural Living Handbook that provides excellent information about agriculture, water and irrigation, soils, weeds and other resource issues for new land owners. Their technician does field visits to farms and provides planning assistance to land owners on irrigation, pasture management and other concerns. They have identified the south part of Deschutes County as a priority area for their water quality improvement efforts.

Three Sisters Irrigation District is aggressively working to replace some of their miles of open irrigation canals with buried, pressurized pipe. They had support from the **Deschutes River Conservancy**, **Oregon Watershed Enhancement Board, USDI bureau of Reclamation and the Pelton Fund** along with **NRCS** and some other partners to convert 4 miles of their main canal to pipe and almost 16 miles of the McKenzie Canyon canals to pipe. They have sponsored two Agricultural Water Enhancement Program (AWEP) projects with NRCS to help landowners do the on farm irrigation improvements needed in McKenzie Canyon, and the upper district and to replace some private ditches with pipe.

Oregon Department of Forestry has been providing assistance to forest land owners to thin forest stands and implement other measures to reduce fire risk, especially around the interface between wild lands and urban or developed areas. **Central Oregon Intergovernmental Council, the US Forest Service**

and the Central Oregon Partnership for Wildfire Risk Reduction are also actively working to improve forest health and reduce wildfire risk.

Wy'East Resource Conservation and Development Area (RC&D). Wy'East's mission is to invest in people, partnerships, and resources that achieve solutions leading to a sustainable future in Central and North Central Oregon. Wy'East employs strategies that protect, restore, enhance, and sustain both communities and natural resources. Wy'East through its Save Water – Save Energy provides technical assistance to farmers who want to conserve energy. Funding is available through BPA and Central Electric Cooperative.

Central Electric Cooperative. The aim of Central Electric Cooperative, Inc. is to make electric energy available to its members at the lowest cost consistent with sound economy and good management. CEC provides electric service to Deschutes, Crook, Jefferson, Grant, Linn, Wasco and Lake counties, in central and eastern Oregon. Energy conservation programs offered include: irrigation pump testing and irrigation equipment upgrade rebates

Deschutes County Weed Department provides information, technical and financial assistance to property owners to control noxious weeds. They also work with hay producers to certify weed free hay. They hold "Pull Together" community events where volunteers can help control weeds on priority sites and gain awareness of the importance of the invasive plant problem

Deschutes River Conservancy is a nonprofit group with a mission to improve stream flows and water quality in the Deschutes River. They actively promote and support water conservation projects and have contributed to some of the canal piping, instream water protection and habitat restoration work in the county.

Upper Deschutes Watershed Council is a nonprofit organization that also works through collaborative efforts to improve stream flows and habitat conditions on the Deschutes River above the Pelton Dam complex. They do riparian restoration projects, education and outreach to improve the watershed. They have helped bring over 11 million dollars of conservation funds to the area.

Resource Concern Trend & Need For Additional Work

This section addresses the remaining work needed to address resource concerns.

Major Resource Concern: Water Supply and Quality

Resource Concerns	Resource Trend & Need For Additional Work
Water Quantity – Insufficient Flows in Watercourses	Water flows are not consistently available in sufficient quantities to support ecological processes and land use and management. Priority streams include Whychus Creek, the Deschutes River – from irrigation withdrawals. Some water is now being dedicated instream from ongoing project savings
Water Quantity – Inefficient	Limited water supplies are not optimally utilized. The application water efficiency practices such as intensive irrigation and water management using technology like soil moisture

Resource Concerns	Resource Trend & Need For Additional Work
Water Use on Irrigated Land	probes; properly designed irrigation systems and better irrigation practices in general are needed. The cost of irrigation improvement for larger pipelines is a barrier to efficient water management.
Water Quality – Harmful Temperatures of Surface Water	Undesired thermal conditions degrade surface water quality. Exceeds state standards for salmonids rearing habitat. >64 F. Target TMDL streams.

Major Resource Degraded Plant Condition

	Resource Trend & Need For Additional Work
Degraded Plant Condition - Inadequate structure and composition	Rangeland in low ecological condition. Over-grazing at the turn of the 20th century has impacted forage production. The degradation of uplands has impacted the ability of the watersheds to capture, store and safely release water. **Juniper invasion** has reduced forage availability and reduced water availability altering the hydrologic cycle throughout the county. Other **noxious and invasive weeds** are present. The County Weed Department has initiated education and incentives on weed control. Also a weed free hay certification program with the Weed Department, and Oregon Department of Agriculture. Unique plant communities like riparian areas have been degraded affecting wetland habitat and unique plant communities.
Degraded Plant Condition - **Productivity, health and vigor**	On rangeland, the invasion of cheatgrass and medusahead rye and other annual grasses into bunchgrass stands, as well as an increasing number of junipers and sagebrush have reduced the forage production. Forest health - overstocked stands create fire hazards and increase insect and disease problems and slow productivity.

Resource Concerns for Fish and Wildlife

Resource Concerns	Resource Trend & Need For Additional Work
Water Quality – Harmful Temperatures of Surface Water	Undesired thermal conditions degrade surface water quality. Exceeds state standards for salmonids rearing habitat. >64 F.
Fish and Wildlife – Inadequate Water	The quantity and quality of water is unacceptable for the species or guild of species of concern.
Fish and Wildlife – Threatened and Endangered Fish and Wildlife Species: Species Listed or Proposed for Listing under the Endangered Species Act	Individuals, habitat or potential habitat for one or more fish or wildlife species is listed or proposed for listing under the Endangered Species Act. Includes: Winter Steelhead, Pacific Lamprey (species of concern)

Major Resource Concern: Inefficient Energy Use & Air Quality Impacts

Resource Concerns	Resource Trend & Need For Additional Work
Inefficient Energy Use – Farming/ranching practices and field operations	Inefficient use of energy in field operations headquarters increases dependence on non-renewable energy sources that can be addressed through improved efficiency and the use of on-farm renewable energy sources. Irrigation pumping systems are the largest user of electrical energy. As the cost of energy increases, climate change and overall cost of farming irrigators have begun to take advantage of energy efficiency programs offered through utilities, Bonneville Power Administration and Energy Trust of Oregon.
Air Quality Impacts – **Emissions of Particulate Matter (PM) and PM Precursors**	Direct emissions of particulate matter (dust and smoke), as well as the formation of fine particulate matter in the atmosphere from other agricultural emissions (ammonia, NOx, and VOCs) cause multiple environmental impacts, such as: - The unintended movement of particulate matter **(typically dust or smoke)** results in safety or nuisance visibility restriction. - The unintended movement of particulate matter and/or **chemical droplets** results in unwanted deposits on surfaces. - Increased atmospheric concentrations of particulate matter can impact human and animal health and **degrade regional visibility**.
Air Quality – Excessive Greenhouse Gas – CO2 (carbon dioxide)	Increased CO2 concentrations are adversely affecting ecosystem processes. Climate change – problems and solution i.e. Carbon sequestration.

Resource Concerns	Resource Trend & Need For Additional Work
Human - Land conversion and development.	**Working Farms & Ranch Lands Preservation.** Land - Change in Land Use. The degree to which implementing the conservation practice is expected to cause an increased change from one land use to another. The urbanization of agriculture land has created very small farms often referred to as hobby farms used for pasture and small livestock operations. The impact includes lack of good pasture management, manure, weed, riparian, and irrigation water management.

Section 4: Prioritization of Natural Resource Problems and Solutions

In Section 4, three areas of resource concern were identified as the primary focus for conservation work in Deschutes County over the next five years.

In prioritizing the resource concerns the following question asked:

- Does the resource concern support the NRCS vision and mission.
- What is the capability of the field office and partners to achieve identified goals?
- What are the values and expectations of the Conservation District and Local Work Group?
- Is the cost to implement the projects feasible with the amount of funding that can be leveraged by NRCS and partners?
- What legislation and regulations impact the resource concerns identified?

Decision Making Process. In 2010, NRCS held special Local Work Group meetings called Strategic Conservation Community Meetings to provide a forum for the development of partnerships and identify opportunities to strategically invest to effectively solve natural resource problems in Deschutes County. The desired outcome was to identify natural resource problems, set priorities, and determine desired future outcomes.

Another meeting was held in 2012 to gain additional input and see if new issues and priorities had surfaced. The issues identified that were within the scope of the NRCS mission were very similar to the 2010 discussion.

The Deschutes Local Work Group has prioritized the county resource concerns as follows:

Priority 1: Water Quantity and Quality

Crop producers and citizens of the county are willing to participate in this effort as water conservation and adequate water quality and quantity is essential to everyone.

Priority 2: Major Resource Degraded Plant Condition: Rangeland

Landowners countywide are willing to participate in this effort as invasive species diminish the grazing capability, decrease stream quality, and destroy wildlife habitat.

Priority 3: Major Resource Degraded Plant Condition: Forest Health

Forestland owners countywide are willing to participate in this effort as the decreased forest conditions create a high risk of catastrophic wildfires.

Section 5: Natural Resource Problems and Desired Future Outcomes

"Our goal is not just a sustainable, nutritious, abundant food supply, but also thriving ecosystems that support a diversity of life. In the next century, NRCS will not only continue to tackle familiar challenges like ensuring clean water and healthy soil, but will also rise to meet new issues, such as clean air, clean energy, climate change, and new technology.

--NRCS Chief Dave White

This section provides a roadmap that guiding the specific direction to address major resource concerns for the next five years. Well written goals, objectives and strategies are written to describe intended results. These characteristics are as follows:

- **S**pecific actions the field office will attribute to the conservation programs.
- A **m**easurable amount of change. For example, the number of acres a conservation cropping system was applied.
- **A**ttainable results that is ambitious.
- **R**ealistic prediction of the expected change from the present condition should be significant, while being realistic about the extent of change.
- **T**rackable over time; the next five years.

SET SMART GOALS

When setting goals, they should be:

S	=	specific
M	=	measurable
A	=	attainable
R	=	realistic
T	=	trackable over a specific time period.

[i] The Deschutes Local Work Group has prioritized the county resource concerns as follows:

Major Resource Concern: Water Supply and Quality

Desired Future Condition (Goal) Water resources quality and quantity acceptable for its intended uses and managed in a efficient and sustainable manner. This outcome includes water quality, water quantity/availability, flooding and watershed health.

Objective / Outcome describes what the specific impact of the technical and financial assistance and the degree to which that impact must occur.

Target Audience: Farmers, ranchers and other landowners.

Specific Action:

- Increase the efficiency of water used on irrigated ground.
- The 2011 and 2012 Conservation Implementation Strategies Deschutes IWM provided funding for irrigation improvements on 6 farms

- The 2011 and 2012 AWEP projects with Three Sisters Irrigation District contracted with 22 land owners in McKenzie Canyon and the upper district on 1200 acres. The Wychus-TSID AWEP project is expected to be funded in 2013-2015 for additional work in the upper district

Measurable:

- Apply Irrigation Water Management (449) and associated practices on 500 acres.
- Additional stream reaches meet habitat requirements for salmonids.

Potential Partner contribution. The Deschutes Soil and Water Conservation District, Three Sisters Irrigation District, Oregon Department of Agriculture, Central Oregon Irrigation District, Department of Environmental Quality, Tumalo Irrigation District, Swalley Irrigation District, Arnold Irrigation District, Deschutes River Conservancy, individual landowners, and the Oregon Department of Fish and Wildlife are all willing members to aid in the water concerns in Deschutes County.

Success will be measured by feedback from the local irrigation districts, water quality assessments, and the number of irrigation systems updated for efficiency.

Major Resource Degraded Plant Condition: Rangeland

Overview. Juniper and invasive species are increasing on what is the largest land use in the county, impacting productivity, wildlife benefits, and the ability to capture, store, and safely release water to rivers and streams. Grazing management can be improved on many of the ranches with facilitating practices such as water developments and cross fences.

Of the 461,000 acres of privately owned land, over 100,000 acres are experiencing declining rangeland health from the expansion or increased density of Juniper. While the problem is increasing, little work is being done by NRCS in Deschutes County to mitigate the expansion now. Juniper is the most visible problem but other noxious weeds and invasive species are also a concern. Annual grasses such as cheatgrass and medusahead alter the fire regime and displace native grasses and forbs. Noxious weeds can be toxic to livestock or reduce productivity for livestock and habitat for wildlife.

Desired Future Condition (Goal) The desired future condition are healthy grazing lands capable of sustained use to produce food and fiber, clean water, healthy fish and wildlife populations and social and economic stability. This condition covers rangeland, pasture land, hayland, forage cropland, and grazed forest land.

Objective / Outcome: describes what the specific impact of the technical and financial assistance and the degree to which that impact must occur.

Target Audience*:* Farmers, ranchers and other landowners.

Specific Action : Working grasslands are maintained or improve long-term vegetative conditions.

Measurable:

- By 2016 agricultural producers will apply Prescribed Grazing (528) and associated practices on 1,200 acres.
- By 2016 agriculture producers reduce juniper invasion on rangeland to improve sage grouse habitat by applying the practice Upland Wildlife Habitat Management (645) and associated practices on 1,200 acres.

Potential Partner contribution. The Deschutes County Soil and Water Conservation District, Oregon Department of Agriculture, Deschutes County Weed Control District, Oregon Watershed Enhancement board, Bureau of Land Management, individual private landowners, and the Oregon State University-Extension are all possible contributors to work independently or in conjunction with the NRCS on this project.

Success will be measured by anecdotal evidence from the landowner and the number of applied EQIP contracts for rangeland health.

Major Resource Degraded Plant Condition: Forests

Overview. Overstocked forest stands on both private and public lands are reducing forest health and increasing the risk of catastrophic fire events. Stands need to be thinned and the wildland urban interface should be the first focus area. Areas of juniper encroachment may also be important. Indicators of success will be anecdotal from landowners until the Oregon Department of Forestry can do a survey of the health of the stands.

Desired Future Condition (Goal). Forest landowners will apply management that will maintain or improve long-term vegetative conditions grazing and forestland.

Objective / Outcome: describes what the specific impact of the technical and financial assistance and the degree to which that impact must occur.

Target Audience*:* Forest landowners.

Specific Action: Forest lands are managed to remove the risk of catastrophic fire events around the wildland urban interface.

- The Upper Deschutes Tri county Forest Health conservation implementation strategy has been selected for funding by the Oregon NRCS leadership to do Forest health and fire risk reduction projects in priority areas

Measurable: By 2016 forest landowners apply Forest Stand Improvement (666) and associated practices on 1400 acres.

Potential Partner contribution. The Deschutes County Soil and Water Conservation District, Oregon Department of Agriculture, Deschutes County Weed Control District, Oregon Watershed Enhancement board, Bureau of Land Management, individual private landowners, and the Oregon State University-

Extension are all possible contributors to work independently or in conjunction with the NRCS on this project.

Success will be measured by anecdotal evidence from the landowner and the number of applied EQIP contracts for rangeland health.

The Deschutes Soil and Water Conservation District, Deschutes County Watershed Councils, WyEast RC&D, Farm Service Agency, Oregon State University-County Extension Service, Oregon Department of Fish and Wildlife, Oregon Department of Forestry, Oregon Department of Agriculture, Oregon Water Resources Department, United States Forest Service, Environmental Protection Agency, Department of Environmental Quality, National Oceanic Atmospheric Administration, and the United States Fish and Wildlife Services are all possible partners to help the NRCS with the forest health concern.

Success will be measured by the number of applied EQIP contracts and future feedback from landowners, Oregon Department of Forestry, and NRCS foresters.

Major Resource Concern: Inefficient Energy Use & Air Quality Impacts

The **desired future condition** to expand on-farm energy conservation and renewable energy production and use. Agriculture makes a positive contribution to local air quality and efforts to sequester carbon.

Objective / Outcome: describes what the specific impact of the technical and financial assistance and the degree to which that impact must occur.

> ***Target Audience****:* Farmers, ranchers and other landowners..
>
> ***Specific Action:*** Implement Agriculture Energy Management Plan - Landscape Criteria (124) on 2 operations. A Landscape Agricultural Energy Management Plan (Landscape AgEMP) contains the strategy by which the producer will explore and address his/her on-farm energy problems and opportunities on the working land. This plan will enable agriculture producers to integrate energy concerns into field office planning assistance and programs to take advantage of public and private utility agriculture energy conservation programs.
>
> ***Measurable:*** By 2016 2 agriculture producers will develop an Agriculture Energy Management Plan - Landscape Criteria Practice/Activity Code (124).

NRCS Future Conservation Program Investment

Restoring flow to the Deschutes River and its tributaries and reducing other impacts of inefficient irrigation remained a high priority to the local work group at the 2012 meeting. Future implementation strategies to work on that issue will require identification of areas where significant progress can be made. The irrigation districts and SWCD will be asked to help find where a concentrated effort and funds could show measurable outcomes.

Rangeland health and invasive species also were high in local priorities but widespread. Priority watersheds or areas would need to be identified for a strategy for that issue. Outreach for the Sage Grouse Habitat initiative could provide some progress in the eastern part of the county.

Oregon NRCS offers 26 programs that include Financial Assistance Programs, Grant Programs, Stewardship Programs, Easement Programs and Conservation Technical Assistance Programs.

The specific programs include:

Environmental Quality Incentives Program (EQIP) - Voluntary financial and technical assistance for structural and management conservation practices on working agricultural lands.

EQIP Organic Initiative - Special EQIP funding is available to organic growers that are certified organic, transitioning organic or those who make under $5,000 of gross organic product farm sales.

EQIP Agricultural Water Enhancement Program (was AWEP now Regional Conservation Partnership Program RCPP) - A program under the Environmental Quality Incentives Program (EQIP) through which NRCS may enter into partnership agreements with eligible entities to conserve ground and surface water and/or improve water quality in a priority area or region.

Conservation Stewardship Program (CStP) (2008 Farm Bill)- Voluntary program that encourages producers to address resource concerns in a comprehensive manner by undertaking additional conservation activities and improving, maintaining, and managing existing conservation activities.

Conservation Reserve Program (CRP) - Administered by the Farms Service Agency (FSA), it is a program that encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to permanent vegetative cover.

Projected future investments for NRCS conservation programs is estimated to be $1,875,000 Below is an estimate of NRCS program investment from 2011 through 2016.

NRCS Conservation Programs	Investment 2011 - 2016
Environmental Quality Incentives Program (EQIP)	$491,000
EQIP Organic Initiative	$71,000
EQIP Agricultural Water Enhancement Program (AWEP)	1,289,000
Conservation Stewardship Program (CStP)	$1,500
Wildlife Incentive Program	26,000
Conservation Reserve Enhancement Program	
Total	$1,875,000

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